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Pathological rupture of the normal spleen: Review with the literature

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ABSTRACT

INTRODUCTION: Atraumatic spontaneous rupture of the spleen is an uncommon but fatal condition that may coexist with other disease. Our case was presented with obvious CT findings of a spontaneous rupture of the spleen.

PRESENTATION OF THE CASE: A 75-year-old woman admitted to the emergency service with abdominal pain. Although there was no evident splenomegaly in the abdominal CT examination, the patient was diagnosed with diffuse large B-cell lymphoma, and densities in harmony with the free air were detected in the spleen and the abdomen.

DISCUSSION: It is clear that a healthy spleen does not rupture without marked trauma; hence, a doctor must carefully investigate the underlying pathology. Splenomegaly, the infiltration of the spleen and the capsule and consequently a splenic infarct and hemorrhage were set forth as the causes of the rupture of the spleen in lymphomas. However, our case had no splenomegaly or splenic involvement of lymphoma in the pathological examination. Even in the absence of splenomegaly, rupture may develop for such reasons as inflammation and embolism. Splenic infarcts are also in the developmental mechanism.

CONCLUSION: Although atraumatic rupture of the spleen is not prevalent, it is a case which must be considered in an acute abdominal pain as it has highly fatal outcomes without CT exam.

1. Introduction

Rupture of the spleen is a medical condition which gives acute abdominal pain symptom and in which early diagnosis is important [1]. CT findings are simple and this condition is easily distinguished from the other acute abdominal pain conditions.

Rupture of the spleen in the absence of trauma or a previously diagnosed disease is largely ignored in the emergency literature.

2. Case report

A 75-year-old woman presented to the emergency department with the abdominal pain.

The medical history of the patient revealed the diagnosis of diffuse large B-cell lymphoma.

No splenomegaly was detected in her contrast-enhanced abdominal CT examination.

However, densities accompanying free air were determined in the spleen and in the abdomen (Figs. 1–3). The patient underwent splenectomy immediately after the diagnosis. In the operation, air- and necrosis-induced rupture was detected under the capsule of the spleen, and no rupture of any luminal organ was found.

In the pathological examination, surprisingly, the splenic involvement of lymphoma was not encountered (Fig. 4A–B). Any source for embolism was excluded with diagnostic tests including cardiac echocardiography and blood culture for bacterial dissemination.

She was discharged 20 days after the operation without any postoperative complication.

3. Discussion

As defined by Hyun et al., this term is reserved for a healthy spleen which has ruptured without overt trauma [1]. A healthy spleen does not rupture without marked trauma; therefore, a doctor must carefully investigate the underlying pathology. The literature review revealed a number of case reports which mentioned splenic rupture [2].

The etiology of atraumatic rupture of the spleen can be examined under six subgroups namely, i) infectious (most frequently EBV), ii) neoplastic (AML, non-Hodgkin's lymphoma, angiosarcoma, ITP, and the malignities causing metastasis on the spleen), iii) inflammatory (chronic pancreatitis, amyloidosis, PAN, and SLE),

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Fig. 1. The intra-abdominal free air is shown (arrow).

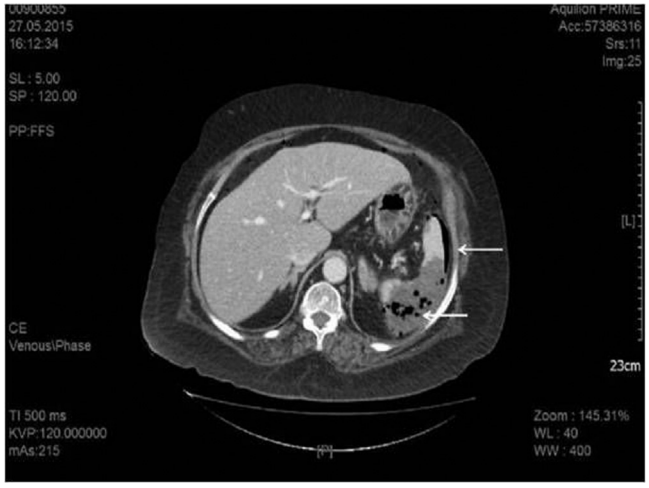

Fig. 2. The intra-splenic air densities (arrow) are shown.

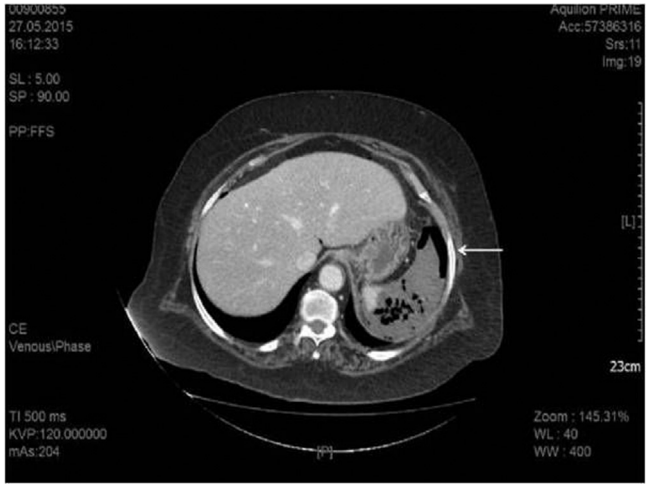

Fig. 3. The intra-splenic air densities are shown at the cross-section passing through a lower level.

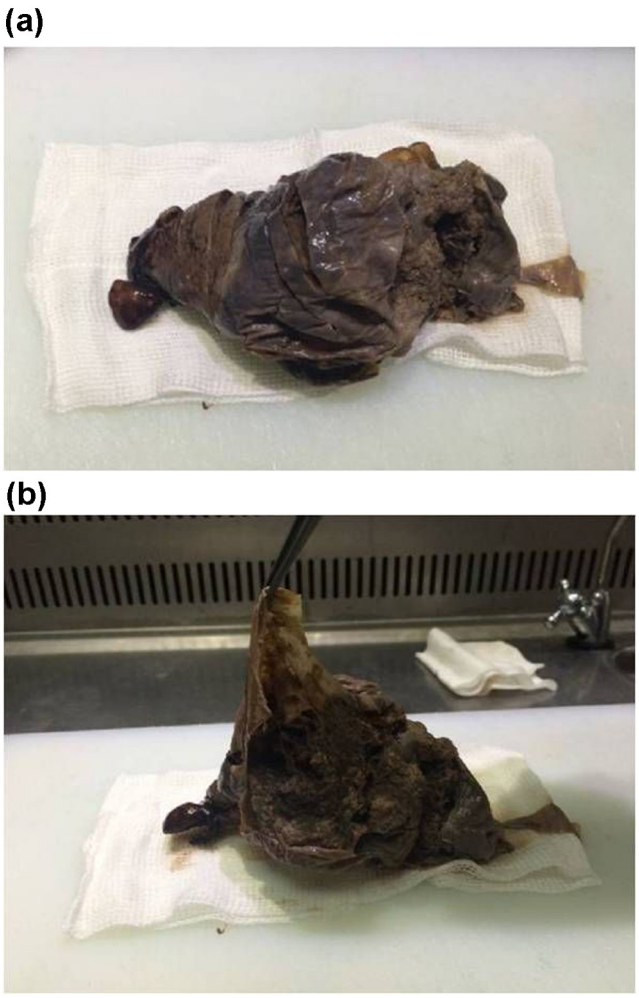

Fig. 4. A- The macroscopic image of the spleen. B- The gap into which air entered between the capsule and the parenchyma is shown.

iv) congenital or structural (hemangiomas, pregnancy, and portal hypertension), v) iatrogenic (anticoagulants, G-CSF, and hemodialysis), and vi) idiopathic [3]. Vomiting-induced ruptures of five spleens have been reported in the literature [4–8]. Chronic pancreatitis is a rare cause of pathological rupture [9].

Splenomegaly, infiltration of both the spleen and the capsule and consequently a splenic infarct and hemorrhage were set forth as the causes of the rupture of the spleen in lymphomas. However, no splenomegaly or splenic involvement of the lymphoma was present in the pathological examination of our case.

Even in the absence of splenomegaly, rupture may develop for such reasons as inflammation and embolism. The developmental mechanism also encompasses splenic infarcts [10]. In the absence of splenomegaly in particular infiltration of both the spleen and the capsule and the resulting infarcts may be considered the basic mechanism.

Furthermore, in the literature review (1950–2011), Bassler et al. [11] evaluated that ruptures developed in 613 cases without any previous diagnosis of a disease or a risk factor. Of these cases, 25 were diagnosed with non-Hodgkin's Lymphoma (Table 1).

In their case report, Sowers et al. [12] stated on the basis of their literature review of 60 years that 2 cases had a normal spleen. In the detailed examination, however, it was stated that the spleen of one of the cases had enlarged, whereas the spleen size of the other one had not been measured. Given this information, the case of presented by Sowers et al. is the first spontaneous rupture of

Table 1
Literature findings of splenic rupture with normal spleen.

Author	Rupture series with normal spleen
Giagounidis et al. [2]	2
Sowers and Aubrey-Bassler [12]	1
Aubrey-Bassler and Sowers [11]	NA

a normal spleen in the literature. In addition, our case with the diagnosis of lymphoma is the second case of rupture of a normal spleen without splenic involvement in the literature.

Giagounidis A.A. et al. [8] evaluated 136 pathological splenic ruptures between 1861 and 1996 [2] and encountered 34% acute leukemia, 34% non-Hodgkin's lymphoma, and

18% chronic myeloid leukemia. In this compilation, only 2 (1.4%) spleens were found to have a normal weight. Cases of splenic rupture are available in the literature on infective endocarditis and septic embolism [13,14]. Splenic rupture is acute abdominal pathology with complicated etiology. However, its early diagnosis is life-saving. Thus, it should be borne in mind in the differential diagnoses in an abdominal pain that develops in the follow-up in cases diagnosed with lymphoma.

4. Conclusion

Even though ultrasound is an inexpensive and easily accessible examination, it has a limited role in diagnosis, for the air echogenicities may be confused with the intestines. On the other hand, tomography is a technique with high sensitivity when showing the air densities in the solid organs. Therefore, the technique should be preferred to CT and US thanks to its superiority.

Although atraumatic rupture of the spleen is not prevalent, it must be taken into consideration in an acute abdominal pain as it may have highly fatal outcomes.

Conflict of interest

The authors declared no conflict of interest.

Financial disclosure

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Informed consent

When preparing the manuscript no informed consent was obtained from the relatives of the patient since they could not be reached.

Author contributions

Concept-Ö.T.; Design-E.E.; Supervision-Y.Ö., P.T.; Materials: M.G.,F.K.D.; Data collection and/or processing: E.H.N; Analysis and/or Interpretation-Ö.T.; Literature review-Ö.T.; Writer-Ö.T.; Critical Review-F.K.D.

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